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ABSTRACT

This report describes a program for improving performance of 54 sixth and seventh grade students with special needs included in a computer applications class. The targeted students exhibited deficiencies in basic computer classroom performance. Probable causes for poor performance were identified through a review of literature and an analysis of the setting. The causes identified included lack of specific communication regarding these students' disabilities, and lack of effective adaptations, poor student attitudes toward inclusion classes, and large class size. The intervention program used several techniques to increase on-task behavior, work completion, and the students' grades. The solution strategies involved student conferencing involving meeting with each student with special needs to set goals and give clear guidelines for success, the use of authentic assessment to improve the manner in which students' progress could be judged, and improving communication between the special education teacher and the computer applications teacher. Post intervention data indicated an increase in the computer classroom grades of the targeted students, more positive aptitudes regarding computer classes, and improved inclusion strategies between the two teachers. Appendices include assessment instruments. (Contains 55 references.) (CR)

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INCREASING STUDENT ACHIEVEMENT THROUGH COLLABORATIVE INCLUSION TECHNIQUES

Lynnette Ludwigsen
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ABSTRACT

This report describes a program for improving performance of sixth and seventh grade special needs students included in a computer applications class. The researchers used student conferencing, authentic assessment, and improved communication strategies to provide individualized approaches for the inclusion students. These techniques were utilized to increase on-task behavior, work completion, and the students' grades. The targeted special needs students in a regular computer applications class exhibited deficiencies in basic computer classroom performance.

Probable causes for poor performance were identified through a review of literature and an analysis of the setting. The causes identified in the setting studied included lack of specific communication regarding these students' disabilities, and lack of effective adaptations, poor student attitudes towards inclusion classes, and large class size.

The solution strategies involved student conferencing, use of authentic assessments, and improved communication techniques between the special education teacher and the computer applications teacher. Student conferencing involved meeting with each inclusion student to set goals and give clear guidelines for success. The use of authentic assessments improved the manner in which students' progress could be judged. Improving communication between the two teachers involved with these students enhanced understanding of individual needs and allowed development of adaptations with a team approach.

Post intervention data indicated an increase in the computer class grades of the targeted students, more positive attitudes regarding computer class, and improved inclusion strategies between the two teachers. In addition, the teachers' peer evaluations acknowledged positive effects and professional growth from peer observations, improved communication, and collaboration on assessment techniques.

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CHAPTER 1

PROBLEM STATEMENT AND CONTEXT

General Statement of the Problem

The targeted sixth and seventh grade special needs students in an inclusive computer applications class exhibit a deficiency in basic classroom performance. These deficiencies are displayed through inability to follow instructions, lack of assignment completion, and failing grades. Evidence for the existence of such a problem includes failure to turn in or complete assignments, negative progress reports, teacher anecdotal records, and teacher observations.

Immediate Problem Context

The targeted sixth and seventh grade special needs students in this study are enrolled in a public middle school, one of two in the district, both of which include grades 6, 7, and 8. The middle school is located along a major state highway in a suburban community. It is a one-story structure built 30 years ago with an addition completed in 1997 due to increasing enrollments.

This addition is equipped with movable walls allowing teachers to create space for large group activities. The 6th grade classrooms encircle the learning center/library. The 7th and 8th grades are located on two separate wings, while the related arts classrooms are housed in another wing.

The computer lab is located in the related arts wing and contains 36 PC compatible computers. Thirty-three of these computers are for student use, one is for teacher use, one is used for class demonstration purposes, and one is used solely by the PE Department. Student

class size is determined by the number of computers available to students ranging up to 33 stations at this time.

According to the 1998 school report card, total enrollment at this school is 593. This count has been projected to increase to 788 by the 2000-2001school year. The report shows the average class size is 29.0 students in 6th grade, 28.0 in 7th, and 23.0 in 8th grade. Ethnic background of the student population was as follows: 84.8% White, 0.5% Black, 13.2% Hispanic, and 1.5% Asian/Pacific Islander. Low income students made up 19.7% of the population. Ninety-five and two tenths percent of the students attend school every day. Eight and four tenths percent of the students are found to be eligible for bilingual education. The student mobility rate is 7.8%.

The school has recently experienced an increased staff size with a large percentage of first-year teachers being hired. Sixteen percent of teachers and related service personnel were first-year teachers in 1997. Another two first-year teachers were added in 1998. The site has a total of 40 teachers, a principal, and an assistant principal. Ninety-seven percent of the teachers are White, while 3% are of Asian/Pacific Islander descent. Thirty-five percent of the teachers are male. The majority of the staff lives in or near the community served by the growing district.

This school has been named a Blue Ribbon School for innovative techniques and outstanding programs for school improvement. The school program includes language arts, reading, mathematics, science, social studies, physical education, health, fine arts, and computer education. The core academics of reading, language arts, math, science, and social studies are all taught for 43 minutes per day. In addition physical education is a full-year course taught 43 minutes per day. The rest of the students' subjects are taught under the umbrella of a related arts

program. These nonacademic classes that include music, health, art, and computer education are also known as "exploratories."

The related arts classes are each taught for 9 weeks or 1 quarter, again for 43-minute periods each day. The related arts teachers see the students each year of their middle school career, while core academic teachers change at each grade level. Some students do not consider the related arts classes to be of equal importance to the core academics. Indeed, some parents express little concern if their children do poorly in related arts classes because those grades are not included in figuring students' grade point averages (GPAs). Even though some of these classes have academic components to them, the only weight they hold is the ability to keep a child from the honor roll if he or she does poorly.

As the problem area targeted deals with special needs students, a brief description of special education programming at the school follows. The school has four special education teachers working with approximately 84 students. The majority of these students qualify for services with a handicapping condition of learning disability; but other disabilities include behavior/emotional disorder, mental impairment, physically handicapped, and other health impaired. Special needs students are placed in one to three self-contained classes in their weakest skill areas. These placements are decided at students' Individualized Education Program (IEP) meetings. Federal Law requires that a written individual education plan be developed and reviewed annually for all children with special education needs. As cited from the Office of Special Education and Rehabilitation Services (OSERS) web page (2000), Public Law 94-142 Federal Register on IEP's states that a child's IEP should consist of the following:

(a) A statement of the child's present educational performance level, (b) a statement of annual goals; (c) specific special education and related services to be provided, (d) the dates for initiation of services and the anticipated duration of services, (e) appropriate objective criteria and evaluation procedures and schedules for determining whether instructional objectives are being achieved, (f) all accommodations and modifications necessary for participation in regular education programs, (g) a statement of the least restrictive environment, and (h) how the child's progress will be measured.

Almost all other services are provided through inclusion in regular classes with support provided through aides in the classroom, adaptations to curriculum, guided study skills, and additional tutoring during study hall periods. The basic model for inclusion students at the school in this study is called Regular Education Initiative (REI). According to their web page, Project Choices (1997), a "least restrictive environment" initiative funded by the Illinois State Board of Education, the term REI was first referenced by Madeline Will, former director of the U.S. Office of Special Education and Rehabilitation Services when President Reagan was in office. REI usually takes two forms:

> First, for students not yet identified for special education, it consists of pre-referral intervention strategies used in general education classrooms to avoid a referral to special education. Second, for students already identified as eligible, services are delivered in a less restrictive way utilizing methods such as collaboration, consultation, and in-general-education-class, rather than pull-out resource services. (paragraph 7).

Inclusion students of higher abilities may be in all regular classes with no support. These students' behaviors and grades are monitored, and the special education teacher acts solely as a

consultant. REI or supported classes are rarely extended to the related arts classes previously mentioned; all students are included without aides or co-teaching support in the areas of health, art, PE, music, and computer education.

Related arts classes are a means for students to explore prevocational subjects in order to discover areas of interest outside the traditional academic realm. Many exploratory classes do have some academic components to them providing students with tools that will be of value in high school and beyond. The overriding goal of inclusion, related arts, and education as a whole is to produce adults who will be active, vital members of society with the ability to make their communities better places to live.

The Surrounding Community

Located 55 miles from a large Midwestern city, the district sits in the county considered to be the most rapidly growing county in the state. The district covers 110 square miles drawing students from three surrounding communities. According to the 1998 special census, the city in which the district is located has a population of 18,251. The average per capita income of the community is $19,375, the median household income is $41,557, and the median housing cost is $115,918. The ethnicity of the community is made up of Whites, Blacks, Hispanics, and Asians.

This medium-sized unit school district containing six elementary schools, two middle schools, and one high school under the jurisdiction of a seven member elected school board, a superintendent, nine principals, and four assistant principals has a total student population of approximately 5,160. The district retains a total of 675 certified and classified employees. The average teaching experience is 14.5 years with 49.9% of district educators holding a masters' degree or better.

The district has earned a reputation as an outstanding school system, having been recognized with the School Match Corporation's "What Parents Want" award for the last six years. This organization honors school districts meeting the criteria parents most often look for when selecting school systems. This award is given to only 9% of the nation's schools. In addition, innovative instructional programs have received statewide and national recognition. One of the elementary schools in the district has been exempted from the state-mandated Quality Review Process and state School Improvement Plan for a year because of the outstanding performance of students on the IGAP test. One of the middle schools in the district was given the distinction of being a 1996 Blue Ribbon School of Excellence by the United States Department of Education. District student achievement exceeds both state and national averages. Strong co-curricular programs in athletics, dramatics, and vocal and instrumental music combined with a variety of clubs and organizations work toward enhancing students' learning experiences.

Parental and community support is very strong in the district. Voters have approved three recent referendums (1995 and 1996) which are now funding a $40.8 million construction and expansion program, additional teachers and support staff, and growth in the area of technology. A proposal to expand technology in all the district's schools and upgrade staff development was unanimously approved by the Board (1999). The components of the plan include replacement of the two middle school computer labs, purchase of 287 new computers to improve the student-to-computer ratio to 6:1, equalize the distribution of computers across the district, replacement and upgrading of network equipment to meet the district's growing needs, and improvement of electrical distribution to classrooms where necessary. The plan also calls for

the creation of a district professional development center to train teachers, library staff, administrators, and classified staff in the use of technology. It will consist of a 20-station computer lab with an LCD projector, scanner, digital camera, printers, and internet access. Funding for the $428,866 plan will come from three sources: the state's technology revolving loan program ($274,938); the district technology budget ($116,172); and the operations and maintenance fund budget ($37,756).

With the national focus of getting computers in every classroom and with the targeted district focused on reaching this goal, it is important that all students experience success in computer classes at every grade level.

The National Context of the Problem

Due to this push for increased technology skills in education, all students need a grasp of basic computer skills. According to Lewis (1997):

> Computers and other technologies are becoming increasingly common in all school programs, including those for students with disabilities. In the late 1980's, almost all U.S. schools owned at least one computer (Office of Technology Assessment, 1988); by the early 1990's, the national average had risen to 1 computer per 16 students. (Market Data Retrieval, 1993 p. 233)

There is a growing need for computer skills at all school levels. Computer labs and beginning keyboarding instruction are now common in most elementary schools. By middle school, students are often required to use computers in writing, research, and presentations for core academic subjects. At this level students are often encouraged to complete homework on

home PCs or use accessible computers such as the library's to do longer reports and projects. Of course by high school, computer use in written work becomes the norm.

Computer usage can open doors and break down barriers for students with learning disabilities and other educational impairments. For students with poor spelling and grammar skills, the computer provides individualized help in self-editing. Computers enhance the neatness and organization of written work for students with fine motor problems. Computer use gives special needs students a sense of control and competence they may seldom experience doing paper-and-pencil tasks. In a study done by Gardner and Bates (1991) students with mild to moderate disabilities were interviewed about their attitudes toward computer use. Their findings indicated:

Students thought they learned more when they used computers.

1. Students liked using computers in school.
2. Students felt smart when they used computers.
3. Students wanted to use computers more during the school day.
4. Students believed that using computers represented work not play.

All these points emphasize the positive nature and motivational quality of using computers with special needs students, and all the students interviewed were in a self-contained special education classroom. However, when students are placed in an inclusive computer class with little or no support, these attitudes often change.

Inclusion is still a controversial subject. In 1975, the Education for All Handicapped Children Act (EAHCA) gave every child with a disability the right to a free and appropriate education. In the 1980s The Regular Educational Initiative emerged. In 1990, Congress

amended and renamed the EAHCA the Individuals with Disabilities Education Act (IDEA). According to Petch-Hogan and Haggard (1999) the amendments consisted of six dimensional goals:

1. All children with disabilities have a right to an education.
2. Each child will be provided an appropriate education unique to his or her strengths and weaknesses.
3. Each child's right to develop to his or her full potential will be enhanced.
4. Each child will be provided the right to associate with his or her nondisabled peers.
5. Every child will be given the opportunity to develop an awareness of individual differences for successful integration into society.
6. The social status of the disabled child will be enhanced by decreasing stigmata related to labeling and placement. (paragraph 4).

Educators, legislators, and parents have been heavily debating these reforms for more than two decades. The controversial aspect of inclusion emerges as full-inclusion advocates argue that only by placing students with disabilities back into the mainstream can the above goals be accomplished. Full-inclusion opponents argue that if special education services are given up, the individual needs of children with disabilities is ignored (Brady, McDougall, and Dennis as cited in Petch-Hogan & Haggard, 1999).

In 1997, President Clinton signed into law an updated version of IDEA calling for even greater inclusion of students with disabilities into mainstream classrooms. According to Diane Shust, an IDEA lobbyist for the National Education Association (NEA) in Washington, there are three major changes that distinguish IDEA '97 from the old version. They are:

1. General education teachers can participate in the Individualized Education Program (IEP).
2. Schools have greater flexibility in disciplining special needs students.
3. There is a greater emphasis on integrating special needs students into the general education curriculum.

In any discussion involving inclusion, it is important to define exactly what is meant. There are three ways in which inclusion can be utilized according to Burnette (1996): (a) placing a single student with disabilities in a general education classroom, (b) placing most students in a district in general education classrooms, or (c) placing all the students in a district in general education classrooms.

However, it is apparent that however one defines or argues the merits of inclusion, it appears significant: in reforming special and general education, inclusion will be the key (Kauffman as cited in Petch-Hogan & Haggard, 1999). The importance of inclusion issues led the researchers to a search for probable causes of difficulties in implementing successful inclusion at the targeted school.

CHAPTER 2 PROBLEM DOCUMENTATION

Problem Evidence

In order to document special education students' problems in computer class, several procedures were utilized. These included weekly grade monitoring, student and staff surveys, classroom observations and anecdotal records.

The special education teacher became aware of students' difficulties in computer class through a frustrated 7th grader named Brad. He was failing and completely frustrated with computer class, so she offered to go to class and see if she could help him. She asked him to explain what he knew, listened to the computer teacher giving directions, and looked at what Brad had to read to do the lesson. Everything was too difficult for him! Brad had given up because the reading level, pace of the class, and number of steps in oral directions were at his frustration level. Sad to say, the computer teacher was unaware of the extent of Brad's disabilities. Added to this was Brad's desire to look cool around all the kids in class, so he covered his problems by being a behavior problem. This experience of viewing the computer class through an LD student's eyes is where the idea for this research project began. Both the computer teacher and the special education teacher continued to keep anecdotal records of special needs students' problems in computer class.

The two teachers reviewed computer grades for all included special needs students under the special education teacher's case management. The following graph displays these students' mid-quarter grades in 1999.

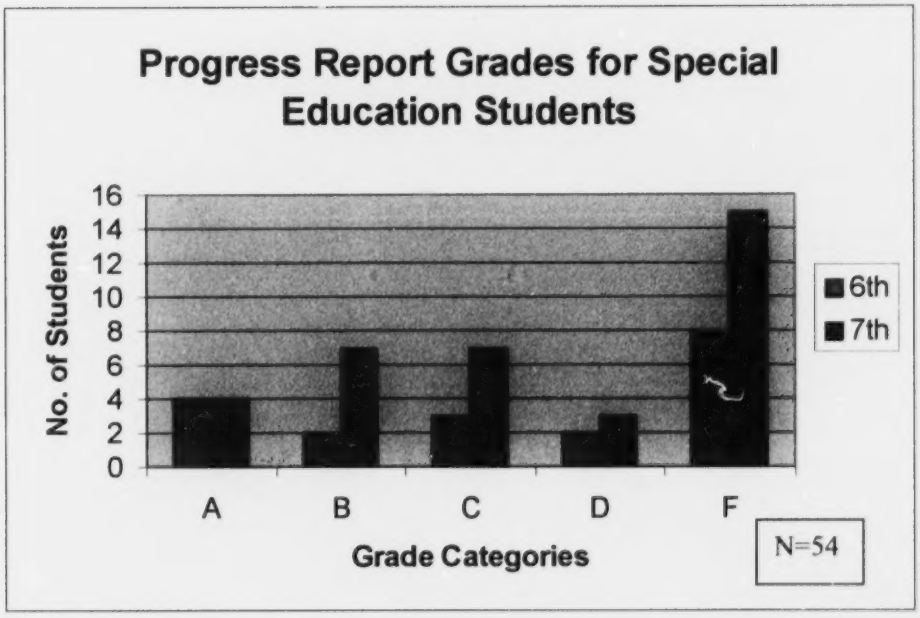

Figure 1 Progress report grades for all 6th and 7th grade special education students in targeted school for the 1999-2000.

It is clear that the highest number of students in both grades were receiving F's at the midpoint of the quarter. A number of steps were taken to try to identify why this large number of students would be failing

First students were surveyed (Appendix A) on their attitudes towards computers and computer class. Forty-seven percent said they never like using a computer to do their homework. Fifty-six percent made comments about how computer class is hard. Here are some of those comments:

1. I am slow and get a headache.
2. I can't learn the keyboard.
3. I am not fast at computers like this person.

4. I don't get it.
5. It's hard for me.
6. I just don't get it.
7. I don't like computers.
8. All them keys!
9. We have to do too many assignments.

Next, observations (Appendix B) of on/off-task behavior during computer class were done two times per week for 4 weeks. Observations included eye contact during instructions, being able to verbalize the first step of the assignment, needing a reminder to keep on task, handing in the assignment on time, and asking for a pass to come in and finish work. Although the majority of students were on task during these observations, they were still unable to complete assignments. This points to the idea that although students were working hard, they could not produce expected results. They seldom asked for a pass to come in and finish work unless the teacher suggested it.

In considering why these students were failing, a most obvious cause for inclusion students' struggles in computer education is simply their learning disabilities. As mentioned in the example with Brad, a number of factors make this particular class difficult. Learning disabilities can impact students in a wide variety of ways. Some students have deficits in auditory processing; what they hear gets confused while their brain transfers auditory input into action. Directions, especially ones with several steps or those given rapidly, may be hard to follow. Of course, many LD students have difficulty reading, so written examples or instructions can give them trouble. Visual motor deficits can impact students' abilities to transfer what they

see to pressing the right keys on the keyboard. Also these inclusion students may simply not perceive an example as everyone else does; therefore, their ability to reproduce it will be incorrect. Other special needs students may require help with organization, remembering to finish an assignment the next day, or approaching a task in a sequential fashion. Short-term memory problems can cause a student to forget basic steps necessary to perform functions with the computer. Use of spell-check programs is even difficult; either the words these students write are so misspelled that the computer does not offer the word the student meant or the student cannot pick the correct spelling from the list.

Add to this the numerous distracters in the environment. There is close proximity to neighbors. Visually, students have their own screen plus all the different things to be seen on their neighbors' screens. There is the hum of the machines and multiple conversations. There are chairs with wheels to roll on. Inclusion students find themselves in a room with 10 to 20 more students than any academic class. All these factors contribute to overstimulating ADHD students and/or those with limited ability to focus. Both the learning tasks and the environment have major impacts on LD student performance in computer class.

In addition to gathering and reviewing student data, these researchers believed staff attitudes towards special education inclusion to be a part of the problem. A survey adapted from a study in Georgia on inclusive education in elementary schools by Gillis and Tanner (1995) was administered to the staff at the targeted school. Specific areas of concern included lack of experience in working with special needs students, concerns about extra time needed to meet the needs of these students, issues regarding large class size, grading and making modifications for included special needs students, and the impact of these students on the "regular" students. The

related arts classes at the targeted school have no aides and very minimal support for special needs students. Yet, all these students are included in these classes while they do not all participate in regular academic classes. The opinions of the related arts instructors were of particular interest. The survey (Appendix C) yielded several noteworthy results. First, 50% of the related arts teachers felt placing a disabled student in regular classes is disruptive for non-handicapped students. The related arts teachers also indicated that they lack sufficient training in modifications. Secondly, 90% of the entire staff agreed that class size should be lowered when including students with disabilities. Finally, while 78% of regular teachers said they have input into programs of students with disabilities, only 20% of the related arts teachers did.

Through the survey the issue of not having enough information regarding specific students' needs surfaced. To assess current problems with communication between special education teachers and the related arts teachers, the writers reviewed communications from the beginning of the 1999-2000 school year. Each related arts teacher received an initial notice to alert them as to which students might need extra help. Two teachers sent a list with student's names: one summarized IEP goals and the second gave names and offered to help with reading the students' tests if given advance notice. A third special educator provided a concise chart including each student's disability, modifications specified in the IEP, and learning strengths and weaknesses. The last teacher wrote a brief narrative summary of each student's learning needs.

All these findings seem to indicate some problems in regards to inclusion students in computer and other related arts classes. The students themselves express frustration. Their grades reflect difficulties in performance. Observations point to effort but inadequate assignment completion. Finally, issues of overcrowded classes, lack of support for inclusion

students and the teachers working with them, and communication between special education teachers and teachers of inclusion students have been identified in the related arts arena. The specific data reported here leads to several probable causes being identified.

Probable Causes

It is the researchers' hypothesis that the basic cause of special education students' poor performance centers on inclusion issues. Inclusion is defined by the Centre for Studies on Inclusive Education (1999) as, "children--with and without disabilities or difficulties--learning together in ordinary schools with appropriate networks of support" (paragraph1). The problems regular classroom teachers face are gaining a clear understanding of these students' needs, the teaching methods that will benefit the included students, having adequate support when inclusion students need extra help. The attitudes that many included students bring to these classes is another problem--they do not feel capable in included classes, particularly if there is not a support person available to them. Katherine Garnett (1996) discusses what goes on in a regular classroom and how it affects three included students--Keesha, Dan, and Jose:

> Classrooms are crowded environments, arranged to maximize general, not close observation of students. Being a member of a crowd is hazardous to Keesha's learning; she fades into the woodwork. They are busy places, filled with rapid interactions. Rapid verbal exchanges leave Dan with a consistent residue of confusion and misunderstanding and he equates asking questions with being stupid . . . For students classrooms are public arenas. The public spotlight can, at any moment, bare this child's failings, making clear the official pecking order. Jose experiences the spotlight of public attention as shame. . . This perception determines his behavior during anything he senses is intended to "teach" him. Avoiding exposure is habitual now and has stunted his willingness to try. (paragraphs 30-34).

To get an idea of how special needs students in this study feel about inclusion in the computer class, they were asked to reflect on the class from the previous school year. Several said it was hard remembering "how to get into stuff," such as file names and steps in various computer processes. One student discussed how the teacher wanted everyone to go at the same speed but some kids were slower. Many of these students wrote about feeling slow and seeing their peers keyboarding much faster. Sometimes cooperative partners would not help them or would explain things too rapidly so that the inclusion students did not have time to understand what the steps were. A number of 7th graders expressed difficulties with spreadsheets. Over half of them were not satisfied with their grades, but expressed a sense of helplessness as to what else they could have done to improve. Their reflections related experiences of feeling lost, slow, and inadequate.

Growing class size of related arts classes is a second source of problems for inclusion students. The related arts classes include P.E., music, art, health, and computer applications at the school studied. While the average size of special education classes ranges from 9 to 20, over the past 3 years the average size of related arts classes has increased from 28 to 31. This increase in the number of students makes it more difficult for the teacher to spend extra time with inclusion students who need reinforced explanations. As noted in Chapter 1, regular academic classes are also somewhat smaller than related arts classes ranging from 23 to 29, and these are classes where special education aides or co-teachers are often available for inclusion students. This larger class size coupled with the lack of familiar special education assistance staff increases the likelihood that these inclusion students will not ask for help. In addition, the percentages of other students who need extra help is growing. Bilingual/ESL populations have

increased by 50% in the last year. In the same classroom the teacher is expected to provide challenge for gifted students. This wide gamut of skills and needs in additional students causes slower students to fall farther behind.

Another issue related to poor performance deals with overall school attitudes regarding these related arts classes. Grades from these classes do not get figured into grade point averages; in fact, it was recommended to one of the researchers by two other special education teachers that she should not worry about supporting her students in related arts classes because that is not "our concern." Many parents also focus on the core academic classes and grades. Students, too, tend to take the 9-week classes less seriously as noted in comments such as:

1. My parents don't care what I get in related arts.
2. I don't have to make up my work in that dumb class.
3. I can still play (sports) if I'm doing bad in related arts.

These attitudes keep special needs students justified in doing poorly in computer class.

For related arts teachers a frequent problem is that they are not informed of the inclusion students' special needs. Often the computer teacher is totally unaware that certain students have reading disabilities or difficulties following oral directions. Related arts teachers are virtually never involved in special education planning meetings as indicated by their survey responses. The communication between related arts and special education teachers often involves only a once-a-year list of students who need tests read aloud without specific notations as to what activities may be difficult or other needed modifications on an individual basis.

To summarize, there are a number of causes for poor performance from special education inclusion students in computer applications class. First of all, these students are sometimes in

need of more help than one teacher in such a large class can possibly give. Secondly, they are included with other students who also require extra time such as both bilingual and gifted students, as well as students who exhibit behavior/discipline problems. Also, the included students often anticipate the work will be too difficult for them. They are often less likely to ask for help in the included classes than in a smaller setting. In addition, the computer teacher usually does not know specifically what these included students need or what their capabilities are. This is due to little communication from their special education teachers. Also, the class lasts only 9 weeks, so that students do not have time to learn teacher expectations or master enough skills for success at their slower pace. Finally, many teachers, parents and students do not put as much importance on performance in related arts classes as they do on year-long academic classes.

The literature suggests several underlying causes for included students' performance in non-special education classes. According to Colleen Tomko (1996) of KIDS TOGETHER, Inc., a reasonable definition of inclusion in education is, "the act of attending regular education classes, with the supports and services needed to successfully achieve the individual's IEP goals while actively participating in activities as a member of the class." (paragraph 8). Herein lies one cause of problems in the targeted school. Inadequate supports and services for inclusion students leads to less successful performance. In an article by Jane Burnette (1996) it is noted that inclusion must provide greater collaboration between educators and "that controversy arises when placement in general education classes without appropriate supports occurs," (paragraph 7). The Learning Disabilities Association of America (LDA) (1993) does not support full inclusion:

> The regular education classroom is not the appropriate placement for a number students with learning disabilities who may need alternative instructional environments, teaching strategies and/or materials that cannot or will not be provided within the context of the regular classroom environment. (paragraph 3).

Students in the targeted school are fully included in related arts classes with very little supplementary support. Inclusion without support is a major factor.

A second large concern for these targeted students is the larger class size of inclusion classes. Pull-out programs and resource and special education classes tend to be much smaller. As percentages of included students have risen, they have contributed to increasing class size even further. According to Lipsky and Gartner (1998) the U.S. Department of Education reported, "the percentage of students with disabilities served in resource rooms has increased considerably . . . in 1993-94, states reported serving 43.4% of students with disabilities ages 6-21 in general classroom placements" (p.78). In a meta-analysis of research on the relationship of class size and achievement summary by Glass and Smith (as cited in Finn, 1998) it is reported that "reduced class size can be expected to produce increased academic achievement and the major benefits from reduced class size are obtained as the size is reduced below 20 pupils" (paragraph 11). In Project STAR (as cited in Finn, 1998) which is the only large-scale study on the effects of reduced class size (1985-1989) the data shows, "in every instance, small classes out-performed other class types . . . and that small classes present up to 1/4 advantage compared to larger classes in every subject tested" (paragraphs 38-39). Large class size in the targeted setting is a factor contributing to performance problems for inclusion students.

The final area of concern involves teacher/student attitudes regarding inclusion. Many regular classroom teachers express worry about not knowing how to effectively teach inclusion students. A 1994 study by Baines, Baines, and Masterson (as cited in Tanner, Linscott, and Gallis) documented frustration of middle school teachers around lack of support needed for inclusion students. From the Baines study, Raisson, Hanson, Hall, & Reynolds (as cited in Tanner et al., 1995) concluded the problems teachers had were not due to inclusion, but to "inadequate communication and poor allocation of resources" (paragraph 36). Even when teachers know how to accommodate their teaching and curriculum for inclusion students, they often do not see a way to take the extra time for these added steps. In a 1999 study by Klingner and Vaughn, it is noted that "studies that have investigated teachers' perceptions and use of effective accommodations/adaptations for students with learning disabilities demonstrate consistently that while teachers find these accommodations desirable, they may view many as not feasible in light of their other classroom demands" (p. 23). Another part of this problem is some educators' lack of feeling responsible for students with disabilities. This may be a result of lack of time, understanding, training or an outdated attitude about special education in general. Scruggs and Mastropieri (as cited in Hobbs and Westling,1998) state that "in a synthesis of 28 studies conducted over nearly 40 years . . . on average only about 28% of teachers report having enough time for inclusion and only 29% of the general educators felt they had enough expertise or training for inclusion" (p. 13). Couple the general educators' reservations about inclusion with students' uncertainty about expectations or how well they can perform, and it is easy to recognize inherent problems with inclusion.

To summarize the probable causes for problems with included students' performance, there are three main issues. Larger class size makes it more difficult to have extra time to cover instructions individually for included students. Secondly, successful inclusion requires good communication between the special education teacher and all the general education teachers working with inclusion students. At middle and high school where students have a larger number of different teachers, this becomes more difficult. The communication must include specific guidelines for teaching and modifying their curriculum along with support personnel as needed. Finally, the students involved must feel supported and be prepared to approach their inclusion classes with positive attitudes and the tools to get help in new ways when necessary.

CHAPTER 3: THE SOLUTION STRATEGY

Literature Review

The basic problem of how to improve special education students' performance in computer class can be solved by improving their experiences as included students. With better inclusionary practices, the students will experience more positive outcomes and regular classroom teachers will be provided with more tools and support. There is a vast array of research and literature on the subject of inclusion, particularly during the 1990's when viewpoints and delivery models were being questioned and changed.

Inclusion is more than placing students with disabilities into a regular classroom. According to Verna Eaton (1996), a special education teacher in the Saskatchewan Valley School District, Canada, inclusion ". . . is a philosophy and a complex and dynamic process. It requires ongoing, systematic and planned interaction with peers and adults in the regular system" (paragraph 3). In "Planning for Inclusion," the National Information Center for Children and Youth with Disabilities (NICHCY) (1995) has listed many factors considered critical to establishing successful inclusion practices and programs. They are as follows:

1. Establish a philosophy that supports inclusionary practice.
2. Provide staff with training.
3. Provide structure and support for collaboration.
4. Establish a planning team for each included child.
5. Make adaptations.
6. Establish policies and methods for evaluating student progress.

In order to consider solutions for inclusion practices in the targeted school, these practices and programs will be discussed in more detail.

Establish a philosophy that supports inclusionary practice

The term inclusion denotes more than the physical placement of a child. All of these components emphasize the complexity of the inclusion issue. A philosophy which endorses the beliefs that all students can be successful, grow, and learn in regular schools and classrooms where diversity is encouraged promotes inclusion according to NICHCY (1995). Teachers' success in developing effective, inclusive learning experiences for all students comes in part from their beliefs about teaching and learning (Jorgensen 1997). These beliefs according to Onosko & Jorgensen, (as cited in Jorgensen, 1997) include:

1. All students can think and learn.
2. All students have value and unique gifts to offer their school.
3. Diversity within a school community should be embraced and celebrated.
4. All students differ in the ways they most effectively learn and express their understanding.
5. All students learn best when they are actively and collaboratively building knowledge with their classmates and teacher.
6. All students learn best when studying interesting and challenging topics that they find personally meaningful.
7. Effective teaching for students with disabilities is substantively the same as effective teaching for all students (Paragraph 25).

According to the Council for Exceptional Children (CEC) in *Creating Schools for All Our Students: What 12 Schools Have to Say*, schools which participated in a 1984 national Inclusive Schools Working Forum did not start with a philosophy of "building a school community" (p. 9). However, they found that as they worked to include all children in their schools, their schools became more unified and mutually respectful of everyone's needs. It was soon apparent that establishing a philosophy and a vision that all children belong, are accepted, and supported by peers and adults promotes a sense of community which helps each child develop a sense of self-worth, pride in accomplishment, and mutual respect. The CEC goes on to report that, "The inclusive schools that participated in the working forum have developed a number of different strategies to nurture a feeling of community, beginning with the development of a common vision" (p. 10).

Pam Aziz (1997), an inclusion network support team leader in Utah, emphasizes that all school personnel must establish the belief that "'ALL' really means 'ALL'" (Paragraph 1). She goes on to state: "attitude is everything and that it is not the situation, but, how we react" (Paragraph 19). This emphasis on attitudes is also voiced by Warren Harris, a sixth-grade teacher in Fairview Elementary School in Bloomington, Indiana. When his school moved toward inclusion, he reports that he didn't realize how many little things needed to be resolved. In an article by Friend and Cook (1993), Harris and his colleagues give advice to ensure a smooth move toward inclusion. In a list of success items, they state: "Inclusion is about attitudes. It works when teachers focus on students' abilities, not their disabilities" (p. 55). Friend and Cook go on to create their own checklist of important topics to discuss when analyzing if a school is ready for inclusion. The first item stresses the importance of having a mission statement that

expresses the belief that the "professionals and other staff strive to meet the needs of all students" (p. 56).

Another finding in a recent study where inclusion was not implemented successfully revealed that a shared sense of vision was never established concerning the meaning of inclusion and why it might be a good idea (Fox & Ysseldyke, 1997). This study looked at the effects on peer acceptance and tolerance of learning disabled students. It was learned that peers were generally accepting, but tended to favor the company of others to that of the disabled students. Fox and Ysseldyke looked at other research from Gottlieb, Corman, and Curci which found that "contact alone will not promote acceptance. It is the responsibility of the staff to ensure this" (as cited in Fox and Ysseldyke, 1997). In order for the staff to accept this responsibility, it is important that inclusion take on personal meaning for teachers and others involved. Fox and Ysseldyke write that the "ultimate success or failure of inclusion at the school will be significantly affected by the extent to which these meanings are similar and positive" (p. 96). They believe one way to achieve this would be through ongoing training and regular meetings to discuss the process of inclusion.

Provide staff with training

Planning for inclusion needs to include all those who will be involved in and affected by whatever inclusion is planned (NICHCY, 1995). As the demand to educate students with disabilities in inclusive educational settings continues to grow, states must develop personnel systems that prepare all teachers to work with individuals with disabilities according to the newly passed amendments to the Individuals with Disabilities Education Act (IDEA) in 1997. In a study to determine the factors that contribute to teachers' abilities to meet the educational needs

of students with special needs in inclusive settings, it was reported that teachers feel a lack of confidence and a greater need for supports and resources (Buell, Hallam, and Gamel-McCormick, 1999). General education teachers indicated a need for various training topics including program modification, assessing academic progress, adapting curriculum, managing students' behavior, developing IEPs, and using assistive technology (Buell, et al., 1999)

Buell, Hallam, and Gamel-McCormick (1999) report in their study that 78% of the general education teachers surveyed felt they lacked inservice training opportunities (p. 148). All of the areas of teacher concern are generally taught in special education preparation programs. However, "without the benefit of preservice program content, general educators are clearly indicating that they need these skills and information to be offered in some form in order to successfully include students with disabilities in inclusive settings" (p. 155).

In a study on "forced" inclusion, O'Shea (1999) reports that staff development and inservice training for staff members are essential. Although the beginning focus should be on acceptance, expectations, and enhancements of attitudes toward change, there must be opportunities for ongoing staff development. The staff needs to know that the initial training is not just a "pep talk," they need to realize that there will be strong efforts to sustain this training in the classroom (p. 179). King-Sears (1997), in a study of best academic practices, states that preparation and ongoing support are intertwined. She reports that "once teachers have received initial training in best practices for inclusion, one should not presume that those practices will be implemented correctly" (Paragraph 123). It is important to have a balance of long-term and "just-in-time" staff development and support (Pankake & Palmer, 1996). Pankake and Palmer agree that "too much training and explaining early on and too little when the actual

implementation is underway are typical errors to avoid" (Paragraph 50). Therefore, training must be ongoing.

It is of interest to note that like inclusion, individuality can be an issue for staff as well when setting up staff development options. Every staff member in a school may be at a different stage of readiness for inclusive practices. Some may have many years of experience with accommodating differences, while other staff members may be relatively new to these processes. Knowing this, it would be faulty for anyone planning support and staff development for inclusion to think "one size fits all" (Beninghof, 1996, Paragraph 7).

Mary Dickens-Smith (1995) in her review of several studies on changing negative teacher attitudes on inclusion concludes that staff development is the key to success (p. 8). She states that once general educators "understand their roles and expectations . . . the fear of inclusion is eliminated . . . and positive attitudes are developed with proper training on the part of both the special and regular education teacher" (p. 6).

Provide structure and support for collaboration

Collaboration is seen as "the key to successful inclusion of all students in a regular class and involves a nonhierarchical relationship in which all team members are equally important, each adding his or her own expertise and experience to the problem-solving process (Stainback & Stainback, 1990, p. 96). As teachers begin to work together, they begin to view collaboration as routine and as strategies that "greatly improved their effectiveness in their classrooms" (Stanovich, 1999, Paragraph 52).

Ripley (1997) notes "historically, teachers have worked alone—one teacher to a classroom" (paragraph 1). Teachers typically spend their day alone in the classroom with "their"

students. They were then expected to possess all the skills to manage student learning and discipline issues and seldom had the opportunities to talk over concerns with anyone (Friend & Bursuck, 1996, p. 74).

According the NICHCY "collaboration needs to happen all along the path of inclusion" (Paragraph 50). Collaboration is a means of encouraging students and staff to support one another. It can describe any activity in which professionals work together for a common goal, but Friend and Bursuck (1996) insist it must go beyond this description: "Only. . . where all members feel their contributions are valued and the goal is clear, where they share decision making, and where they sense they are respected, does true collaboration exist" (p. 74).

Friend and Bursuck present four means of effective collaboration in inclusive schools:

1. Shared Problem Solving.
2. Co-teaching.
3. Teaming.
4. Consulting.

The first method, shared problem solving, is the basis for many collaborative activities teachers undertake for learning disabled students. The most common event is when a classroom teacher and special education teacher meet to decide on appropriate modifications or interventions for a student. It is not as simple as it seems: the needs, prospects, and ideas of each member must come together in order to create the desired outcome.

The following steps must be completed in order for shared problem solving to be an effective means of collaboration: (a) discover a shared need, (b) identify the problem,

(c) propose solutions, (d) evaluate ideas, (e) plan specifics, (f) implement solution, and (g) evaluate outcomes (p. 82).

In the Council for Exceptional Children's book, *Creating Schools for All Our Students*, all schools that participated in this working forum tried some form of co-teaching—the second type of effective collaboration. Classes in this setting are usually larger than a normal-sized class, but smaller than two classes combined. The teachers reported that they could tell when a partnership worked as they "stop referring to 'my kids' and 'your kids' but instead say 'our kids'" (p.21). Friend and Cook (1992) see co-teaching as an instructional approach in which a special and a general education teacher share responsibility for planning, delivering, and evaluating instruction for a mixed group of students, some of whom have special needs.

Working in this environment creates a dynamic, high-energy classroom that promotes increased learning for students and teachers (Cook and Friend, 1992). In order to have effective co-teaching, the following items must be in place: (a) Common, uninterrupted planning time between the special and general classroom teacher; (b) Teachers must be flexible; (c) Teachers must be willing to take risks; (d) Roles and responsibilities must be defined so teachers have equal footing; (e) Effective co-teaching is a successful match between teachers' styles and philosophies; (f) Teachers must have good communication skills; and (g) Administration must provide support in terms of budgets and scheduling (Arguelles, Hughes, Schumm, & Shay, 2000).

An important aspect of co-teaching is that partners provide each other with evaluation and feedback. Research findings on collaboration are very positive for special education students, their peers, and the professionals involved (Ripley, 1998). Students report better self-

images, more motivation, and gained recognition of their academic and social strengths while staff members reported that they grew professionally, had personal support, and enhanced teaching motivation.

The third means of collaboration involves teaming: formal work groups that have clear goals, committed members, and leaders which operate like members of any other type of team. Each member of the team has multiple roles: a profession role—classroom or special education teacher, a personal role—being a positive or negative influence, and a team role—what is thought to be the main goal or purpose of the team. Below are the characteristics of effective teams as defined by Friend and Bursuck (1996, p. 91):

Characteristics of Effective Teams

1. All participants understand, agree to, and identify the primary goal for the team.
2. The team is characterized by open communication that includes ideas, opinions, and feelings.
3. Team members trust one another; that is, they know no one will deliberately take advantage of another team member.
4. Team members support each other by demonstrating care and concern.
5. Team members manage their human differences. They clarify how they are different from one another and use these differences as strengths for creative problem solving rather than as hindrances to problem resolution.
6. Teams meet and work together only when necessary.
7. Team members have fundamental team skills including those for communication, those for addressing task goals, and those for maintaining effective team functioning.
8. Teams have leaders but recognize that leadership is shared by all team members.

The final type of collaboration is that of consultation which is a specialized problem-solving strategy. This is where one professional who has a particular expertise gives assistance to another professional or professionals who needs the benefit of that expertise. In this model there is not true collaboration as the problem is not shared; it is being experienced by one professional asking for strategies and ideas from another.

Regardless of the type of collaboration taking place, it involves commitment by the teachers who will be working together, by school administrators, by the school system, and by the community. In successful inclusive schools, teachers take the time to work together toward the education of all students and do not assume "territorial attitudes regarding special education or general education" (Mamlin, 1999, paragraph 7).

Establish a planning team for each included child

Once in the regular classroom, the included children should not come alone. The NICHCY warns of the regular classroom being a "dumping ground" where learning disabled students are thrown without adequate support to them or their teachers (p. 8). Because each included child comes into the classroom with their own learning disabilities and IEPs, the teacher should not be expected to integrate a student with a disability into the regular classroom alone; in fact, working as a team is a key to success. In discussing inclusion, Stainback, Stainback and Stefanich (1996) suggest, "In the beginning teachers will likely need some assistance from a team of people when learning to provide appropriate learning experiences for the diversity of students in their classrooms." (p.15)

The idea of establishing a planning team relates closely to the idea of collaboration. However, collaboration focuses more on the instructional teaming of teachers, while a planning

team may include a wider array of individuals. The planning team is a natural outgrowth of the IEP team process as well as the middle school team approach. The planning team should include all adults working with an included student. Formally the IEP team serves to identify a student's needs, goals, and educational program for a year's time; IEP team participants include all school personnel having professional knowledge about the student as well as the student's parents. The planning team should be the active component that keeps an inclusion student's education productive and successful week to week and month to month.

According to the NMSA (National Middle School Association), the middle school team approach is often highly conducive to a planning team approach (Robertson and Valentine, 1997). This is noted by Walther-Thomas (as cited in Robertson and Valentine, 1997):

> Interdisciplinary team organization is a distinguishing characteristic and foundation of the effective middle level school. Interdisciplinary teaming allows the same group of teachers to work with the same group of students. This gives the team of teachers the flexibility and autonomy to create the most efficient learning environment for each student in the group (paragraph 6).

Another idea involving a planned team approach is called collaborative problem solving or CPS. It is a process for teachers and other staff members to work together in designing positive programs for inclusion students (Hobbs and Westling, 1998). CPS is a way for all involved staff members to take ownership for solving problems in educating special needs students. In a study utilizing CPS by Hobbs (as cited in Hobbs and Westling, 1998) he found "when professionals addressed problems together, they identified more problems, more

antecedents or 'causes,' more objectives, and more intervention plans than when they worked alone." (p. 14)

Hobbs and Westling (1998) list 5 basic steps to ensure success for inclusion students in the collaborative problem solving strategy:

1. Define the problem an inclusion student is experiencing.
2. Identify the causes.
3. Set objectives.
4. Identify and implement solution activities.
5. Monitor for success. (p. 17).

There are many examples and models of planning teams for inclusion students. In an article published by Loydene Hubbard-Berg (1997), the author describes inclusion network support teams. These teams provided training and support in 11 school districts across Utah. This network included consultants who could go to individual schools and facilitate problem solving. Within the site used for this paper's research, a similar approach has been utilized with more severely handicapped inclusion students. Use of an inclusion facilitator to coordinate planning meetings has helped identify needs, keep all involved staff members on target, and saved teaching time. In a building-based inclusion program studied in Oswego, New York (Schnorr, Matott, Paetow, and Putnam, 2000), it was found that "Middle School interdisciplinary teams provide a structure for assimilating students and staff from programs that formerly operated in isolation. The most successful teams are those where there is a growing, shared ownership for all students." (p. 50).

All planning teams for inclusion students have both special education expertise and the input of the regular classroom teachers. While some teams may involve the more formal structure of the IEP team, often the most necessary planning teams are the people working with the students day to day. This may include aides, parents, counselors, social workers, principals, speech therapists, and the student's peers. One student at the middle school targeted in this study has a "support circle" of peers who provide their perspectives on his needs at some planning team meetings. The most important factor for a planning team is that it improves the inclusion process for the students it targets.

Working as a team assures that individual student needs remain the top priority in the inclusive classroom. Therefore, in order to be most successful, inclusion requires planning and communication. In fact, teamwork is integral to the success of full inclusion placements. The team members should include regular and special education teachers, site administrators, parents, and others involved in the student's education. The team must work together in order to build upon successes and solve problems as they arise.

Make adaptations

The NICHCY uses Alice Udvari-Solner's (1992) definition for adaptations as: "any adjustments or modifications in the environment, instruction or materials used for learning that enhances the person's performance or allows at least partial participation in an activity" (p.3). Burnette (1996) describes this as "flexible learning environments"—seeing children not moving in lock steps but rather following individual paths to learning (paragraph 49).

It is important to realize that just because a student may be labeled with a disability, he or she should still be participating in the planned classroom activities like the other students. Many

instructional strategies can be put in place to make sure that the student succeeds at his or her own ability level. Cooperative grouping, whole class instructions, student pairings, labs, teacher-student conferencing, and portfolios can be used for all students. In utilizing varying modes of instruction, student boredom can be decreased and the teacher can spend more time with each student to assess his or her progress (Jorgensen, 1997).

Adaptations are one of the major critical factors to successful inclusion because they give inclusion students opportunities to experience success. In the targeted group of this study, the students were working in a computer class where no specific adaptations were being made. This is a lose/lose situation. The teacher loses because the students dislike the class, and the students lose because they see no way to learn what is expected. Often the teacher may believe inclusion students are not trying, and the students are certain they will fail the class.

To override this typical assumption of failure or "learned helplessness" which many included students experience, the teacher can role model positive reactions to frustration, making mistakes, or failure. This is an adaptation to improve attitudes and willingness to risk trying for students who often do poorly in school. In an article entitled "Failure Syndrome Students," Jere Brophy (1996) suggests that teachers encourage positive student attitudes by:

1. Acting more as resource persons than as judges.
2. Focusing students more on learning processes rather than on outcomes.
3. Reacting to errors as natural and useful parts of the learning process rather than as evidence of failure.
4. Stressing effort over ability and personal standards over normative standards when giving feedback.

5. Attempting to stimulate achievement efforts through primarily intrinsic rather than extrinsic motivational strategies (paragraph 14).

These teacher behaviors are important in inclusion classes, as special needs students are generally more anxious in larger groups and the faster pace that inclusion classes present for them.

In discussing adaptations, it is important to note that all general educators make some types of adaptations. They adapt to scheduling changes, varying class environmental and personality factors, grouping arrangements, and materials usage. Fuchs and Fuchs (1998) provide a study discussing typical adaptations teachers make. Although teachers may make slight changes such as giving examples or re-explaining if students are struggling, they often do not want to veer much from their planned lessons. The study notes that "general educators often do not introduce specialized instructional adaptations as a natural consequence of student confusion or difficulty" (paragraph 9). In a similar study done in 1992, Fuchs, Fuchs, and Bishop (as cited in Fuchs and Fuchs, 1998) found that "Among 110 general educators only 25% made any revision to their six-week instructional plans for their students with LD. Few suggested the introduction of alternative instructional approaches; most adaptations reflected reduced expectations" (paragraph 10). These statistics are reflected in the targeted school being studied, so it is important to consider suggested methods of increasing adaptations in inclusive classrooms.

In a study on curricular adaptations done by The Kansas State Board of Education, Alice Udvari-Solner (1992) identified 6 main categories: (a) instructional groupings or arrangements,

(b) teaching format, (c) environmental conditions, (d) curricular goals and learning outcomes, (e) instructional materials, and (f) level or type of personal assistance (p.7).

Each of these categories will be discussed in greater detail.

Instructional groupings and arrangements include teacher-directed large-group and small-group, cooperative learning, student-directed small group, peer or cross-age tutoring, one-to-one aides, or independent seat-work. Although a combination of these groupings is usually used, large-group and independent seat work are the most difficult for inclusion students. Paying attention to instruction or making sense of written work is often problematic. Inclusion students benefit from built-in support systems of interactive grouping such as peer tutoring, small groups, and cooperative learning.

Cooperative learning is a familiar and very common technique in many classrooms. It is defined by Bellanca and Fogarty (1991) as "an instructional strategy which uses cooperative 'groups' as a tool for creating a more cooperative classroom in which student achievement, self-esteem, responsibility, higher level thinking, and favorable attitudes toward school increase dramatically." (p.2). According to Johnson and Johnson (1992), cooperative learning has five fundamental characteristics. "First, the students in groups have positive interdependence. Second, cooperative groups require face-to-face interactions. Third, members of cooperative groups have individual accountability. Fourth, cooperative learning stresses student interpersonal skills. Finally, group processing is structured within the learning situation." (p.186). Both the non-competitive nature of cooperative education and its emphasis on learning with peers, rather than adult assistance, definitely foster independence in inclusion students.

According to Udvari-Solner (1992), teaching format is closely related to a teacher's classroom instruction arrangement. The most frequently used formats are lecture and demonstration. These may be followed by a whole-class inquiry or discussion. These techniques require listening skills and keeping up with things through auditory processing which is problematic for many inclusion students. These activities are also the time of dread for being called on and not knowing the answer. Another type of teaching format includes games, activities, and presentations; these foster active participation. The last type is experiential or real-life activities. These help relate classroom skills to uses in everyday life. Udvari-Solner continues by stating:

> The value of activity-based and experiential lessons is becoming more evident as the school population becomes more and more diverse. These teaching formats offer options to assign different roles to students, delegate tasks that are matched to the student's ability level and knowledge base, individualize the presentation of information and differentiate the materials more effectively than in lecture/demonstration or whole class inquiry format. (p.11)

The areas of learning that engage students and let them connect to the world around them are effective for most students.

Environmental adaptations include lighting, noise level, physical arrangement of the room, classroom equipment, and visual or auditory input. Examples of an environmental adaptation might be including a large area to maneuver a wheelchair or providing two seats for a student who cannot sit still for long periods. This is a straightforward adaptation most regular teachers are easily able to consider.

Adapting curricular goals or learning outcomes are more complicated and more controversial. Teachers may feel bound by district curriculum guidelines, state learning standards, or national test scores. In an article by Cheryl M. Jorgensen (1997), she advocates determining the content of curriculum as being more than just a body of knowledge:

> All students, including those with disabilities, need to learn three "types" of skills (1) dispositions and habits of mind (such as inquisitiveness, diligence, collaboration, work habits, tolerance, and critical thinking); (2) content area knowledge (in science, social studies, language arts, computers, the arts, etc); and (3) basic academic skills such as reading, writing, and mathematics (paragraph 25).

While much of the discussion of adaptations considers how to deliver the content area knowledge, methods of studying and learning strategies need to be incorporated into all inclusion classes.

In support of learning strategies, Oas, Schumaker, and Deshler (1995) discuss "Tools for Learning to Learn in Middle and High Schools." This article lists multiple examples of learning strategies for inclusion students. A summary of four main groups is presented in the following table (paragraphs 38-39).

Table 1
Types of Learning Strategies and Skills for Inclusion Students

Strategy	Name	What it Teaches
Students acquire information from written materials	Paraphrasing	Summarize in their own words
	Visual Imagery	Form mental images of content
Enable students to identify, organize, and store information	FIRST-letter Mnemonic	Organize key items by first letters
	LINCS	Learn meanings of new words
	Paired Associates	Learn information that is related
Facilitate written expression and demonstrate competence	Paragraph Writing	Plan and write typical paragraphs
	Test taking	Express knowledge on tests
	Error Monitoring	Students identify errors and edit
Improve math problem solving	Strategic Math	Quickly solve computation problems with basic facts
		Use computation strategies to solve story problems

In the 1999 Klingenstein Project entitled "Teaching for Inclusion: Curricular Adaptations for (Learning Disabled) Students in Mainstream Classes," Kara Baronian presents the idea that "Students need equal instruction in what to learn as well as how to learn it" (paragraph 17). The author goes on to discuss the importance of all teachers teaching procedural skills and strategies and critical thinking skills along with content knowledge:

> The Kansas University Institute for Research in Learning Disabilities advocates the explicit teaching of specific strategies for processing information as the most effective method of addressing the demands of the inclusive classroom. It is important to reiterate,

> however, that the explicit teaching of strategies is not simply a method of getting one group of students to 'catch up' to another group. Indeed, all students need to be taught how to reflect on their thinking processes, and in fact, 'strategies developed for students with disabilities . . .often prove to be sound practices in the instruction of all students' (paragraph 25).

This idea encompasses the whole philosophy of inclusion. All students would be taught skills that it is often assumed they already possess to assimilate the content material they are given. Definitely at the middle school and high school level, students lack many techniques that could improve their learning.

Boudah, Lenz, Bulgren, Schumaker, and Deshler (2000) talk about two effective strategies for adapting curriculum for LD students, namely, task specific strategies and content enhancers. Task specific strategies involve focusing on what needs to be done with the given information, i.e. memorizing it, summarizing it, making connections for new vocabulary, or providing an overview of a new chapter's material. Content enhancers are usually some type of graphic organizer that clarifies information and provides a vehicle for note taking and review.

The Unit Organizer (Appendix D) is a tool designed specifically for this purpose. In research conducted across middle school and high school inclusive classrooms, all levels of students improved their class performance and grades using this unit organizer (Boudah et al., 2000). In addition to improving student performance, this method was also found to increase the teachers' instructional organization (p.56). Content enhancement provides a clear visual "big picture" as a basis for previewing, note taking, study, and review.

Another common adaptation is to change or modify instructional materials. This includes providing hands-on manipulatives, simplified formats for texts and worksheets, audiotapes, and many more. A drawback to these types of adaptations is that some included students do not want attention called to their different learning needs. These students may prefer utilizing alternative materials outside of the regular class setting.

Changing the type or level of assistance is a familiar adaptation. The regular classroom teacher providing prompts, verbal cues, gestures, or restating instructions sometimes accomplishes this. If a student requires further assistance, it may be provided by instructional aides, peers, older students, related service personnel, or classroom volunteers.

Udvari-Solner (1992) makes an important point:

> To facilitate inclusion and independence, an underlying goal should be to reduce the need for specialized assistance over time. Consequently, it is preferable that natural supports, or support that can be provided by the general education teacher and peers, be employed to the greatest extent possible. The intervention or assistance from someone outside of the classroom structure can sometimes cause the student to be stigmatized and reduce spontaneous interactions from peers in the environment (p.13).

It is very important to remember that with true inclusion as the goal, the adaptations must be as unobtrusive as possible.

The last category of adaptation presented is to create an alternative activity. Ideally the alternative activity also includes non-disabled peers and may occur at a learning center within the regular classroom. The easiest way to make this a naturally occurring adaptation is to utilize multiple intelligence lessons in the classroom.

Multiple intelligences theory is based on the work of Howard Gardner who found that people possess eight types of intelligences: verbal/ linguistic, logical/mathematical, musical/rhythmic, visual/spatial, bodily-kinesthetic, interpersonal, intrapersonal, and naturalist. In a multiple intelligence classroom students are presented with a wide range of learning activities. This approach very naturally incorporates using stronger learning modalities to help develop weaker ones. This is exactly what students with disabilities need to do to become better students. As David Lazear, author of Eight Ways of Teaching, explains:

> I often wonder how many kids are in special education classes simply because we have not known how to approach their knowing and learning through a different set of doorways than the verbal/linguistic and logical/mathematical, which dominate all systems of education in the Western world today (p. xi).

Multiple intelligences and many more strategies can enhance all students' performances when taught as part of the regular curriculum.

Establish policies and methods for evaluating student progress

Policies and methods must be established to evaluate student progress. Questions begin to arise about how a teacher reasonably and fairly evaluates students—especially students with disabilities who may not be working toward the same goals as their peers without disabilities. How are student goals and objectives established? Along with this what about curriculum based assessment, authentic assessment, and determining final grades? NICHCY (1997) points to the IEP to provide a benchmark against which to measure student progress.

First, it is important to define what is meant by evaluating and assessing students. Most commonly, people think of testing and giving grades. However, Kay Burke (1999) defines the

terms differently: "Assessment is the ongoing process of gathering and analyzing evidence of what a student can do. Evaluation is the process of interpreting the evidence and making judgments and decisions based on the evidence" (p. xviii).

Policies and methods must be established to fairly evaluate inclusion students' progress. How a teacher reasonably evaluates students—especially students with disabilities who may not be working toward the same goals as their peers without disabilities—is a difficult question. Student perspectives on their assessment and evaluation must also be considered. Janette Klingner and Sharon Vaughn (1999) summarized 20 studies done in the last 22 years discussing students' perception of grading practices. They found that the majority of students did not feel it was fair to modify the grades of LD students. Also, most middle school students said that letter grades are an expected and necessary part of school life. These students did not value "modified" grades. Adapted homework also received a low score. They found "Students with learning disabilities want to be involved in the same activities, read the same books, have the same homework, be judged with the same grading criteria, and be a part of the same groups as their classmates" (paragraph 62).

Assessment and evaluation can be critical to making inclusion students truly successful in their own judgment as well as their peers' estimations. Particularly at the middle and high school level, the importance of students' perceptions cannot be overlooked.

The National Center on Educational Restructuring and Inclusion (NCERI) discusses a refocused use of assessment:

> Traditionally, student assessments have been used as screening devices. Inclusive education schools and districts report moving toward more "authentic assessment"

> designs, including the use of alternative measures of performances, and generally working to refocus assessment. They report that assessment is used not just as a standardized measure but one that builds a greater understanding of the student and her or his needs (p 123).

In Kay Burke's How to Assess Authentic Learning (1999), she lists the components of authentic assessment:

1. Meaningful performance tasks.
2. Clear standards & criteria for excellence.
3. Quality products and performances.
4. Emphasis on metacognition & self-evaluation.
5. Learning that transfers.
6. Positive interaction between assessor and assessee (p.xxi).

Portfolio assessments have become an increasingly common method of authentic assessment. Burke's definition of a portfolio is "a collection of student work gathered for a particular purpose that exhibits to the student and others the student's efforts, progress or achievement in one or more areas" (p.58). Three other related types of authentic assessment are learning logs, journals, and metacognitive reflections. All four ask students to think about their learning in terms of summarizing what they have learned and how they learned and write about their learning process.

Performance tasks involve students using many skills to demonstrate or apply their learning. Generally students have some choice as to how they will accomplish this, and it includes use of a rubric. Rubrics are a set of specific scoring criteria for a performance task; they

let students know what the teacher expects at the beginning of the learning tasks. There are many other authentic assessments such as observation checklists, conferencing, graphic organizers, and teacher-made tests. The most important point about authentic assessment is that students are evaluated in a more individualized and meaningful way.

Another useful assessment technique is Criterion Based Assessment (CBA). CBA is an effective method of discovering what students know and can do. It lets the instructor continue to use the standard curriculum without "watering it down." King-Sears, Burgess, and Lawson (1999) developed a method to help instructors assess the skills and information most critical to their classes. They used the mnemonic APPLY:

1. ANALYZE the curriculum to select critical skills from each unit, state standards or district benchmarks in the given subject area. These can be coupled with critical skills targeted in a student's IEP.
2. PREPARE items to meet curriculum objectives such as worksheets, or a writing rubric that can be quantified.
3. PROBE frequently during a unit to see how well instructional techniques are working.
4. LOAD the quantifiable information using a graph format. This encourages students and teachers to note progress in learning. Having students graph their own data makes this process even more meaningful.
5. YIELD to results. When a teacher reviews a student's data, it should help determine necessary decisions for the next steps in instruction.

A final point made by the author was that criterion-based assessment techniques need not be used only with inclusion students. Educators often find it beneficial to utilize these techniques with all students.

As the literature indicates, inclusion is a very complex issue with each characteristic of successful inclusion dependent on the next. It is difficult to take any one aspect and say this is definitely the key to success; and this in part is another problem. Many schools use a particular approach or strategy as their inclusion solution.

Administrators, special and general education teachers, support personnel, parents, and the community must work together to solve problems, to develop innovative programs, and to put into action strategies and adaptations to educate all students regardless of abilities or disabilities. Providing for true inclusive education involves many complex matters including time, support, resources, monitoring, and persistence.

Project Objectives and Processes

As a result of improved communication between the special education and computer teacher, student conferencing, and the use of authentic assessments, during the period of January 2000 to May 2000, the targeted 7th grade special needs students will improve performance, as measured by grade comparisons, student self-checks, anecdotal records, and post-conference student reflection journals.

In order to accomplish the project objective, the following processes are necessary:

1. A student conference system to individualize instruction and make students more positive and clear on expectations will be developed.

2. Specific planning time and concise procedures for communication between the special education and computer teacher will be scheduled.
3. Authentic assessment strategies to be utilized in computer applications class will be developed.

Project Action Plan

A student conferencing system will be developed and implemented. This will be a way to discuss students' concerns and needs so that they can have a successful 9-week term in computer applications class. There will be three specific steps in carrying out this plan. First we must identify the purposes and procedures of the conference. Next a written student conference contract must be developed to use during these meetings. Finally, a schedule for implementing these procedures must be agreed upon. These conferences will begin in the second or third week of the new quarter and in subsequent quarters, thereafter. They will be held formally at times of day to include both the computer and the special education teacher: 8:00-8:30,12:10-12:40, 12:45-1:30, or 3:00-3:30. Students may have a second meeting at midterm if necessary. The meetings will be held in the computer lab so that students relate the discussion to the environment in which it will apply.

The student conferencing strategy was chosen for several reasons. First of all, it is hoped it will alleviate some fears for the targeted inclusion students. Without an aide or special education teacher in the room, they often feel lost. The conference should give them a feeling of being supported. It will also let them know that the computer teacher understands their needs and is willing to make adaptations to ensure their success. By involving them in the development of the contract, they get a better understanding of computer class expectations.

This process will hopefully make them more invested in trying and improve their attitude towards their ability to succeed.

The conferencing will be done two-to-one; together both teachers will meet with each inclusion student. The conferences will last an average of 10-15 minutes. At the end of the conference the student will sign a contract and receive a copy to use as a guide during computer class. The contract will delineate authentic assessments students must complete to earn their credit for the class. The student conference will give each inclusion student a boost to feel that he or she is entering the class knowing what to do to succeed.

To prepare for successful conferences and modifications, the first step must be to invest planning time in communication between the special education teacher and computer teacher. An effective system for discussing students' abilities and possible modifications, along with what computer skills are focused on will be the major topics. To begin, it will also be necessary to define what is missing in the information on inclusion students the computer teacher currently receives. A form to concisely answer the stated concerns will be developed. The special education teacher will then review the records of students currently included in computer applications class and write summaries. Then both teachers will set specific times to communicate initially and weekly to discuss students' ongoing needs and successes.

Meetings between the two teachers will take place two or more times per week during a mutual planning period (12:10-12:40). The teachers will meet in the computer lab to increase the special education teacher's awareness of the total computer lab environment.

This communication framework will be ongoing but most intensive at the beginning of each quarter and at mid-term to assess how things are going before progress reports. It will only

involve 6th and 7th grade special education students at this time and is being piloted only in computer class.

The purpose of this solution strategy is to improve inclusion in the related arts setting. This communication will make both teachers more aware of how to increase students' success. It is agreed that there is currently far too little information flowing between special education and regular classrooms. Setting up definite guidelines for the communication process will ensure it occurs in a timely and efficient manner.

The third process will be developing authentic assessments to be utilized in computer applications class. Students will be assessed through revised testing and grading to include peer and self-evaluations, rubric scoring, performance demonstrations, and cooperative group work. The teachers will plan a lesson appropriate for utilizing each assessment type. For example, the assessment of PowerPoint skills will utilize peer and self-evaluation via a rubric. Spreadsheets will be taught through group work, and performance demonstrations will have students show various skills upon completion of practice exercises.

Authentic assessment techniques will be used once a week. Each type of agreed upon assessment will be tried once in the 9-week period. These interventions will be utilized with the whole 7th grade computer applications class. Individual criteria as needed will be delineated in the student conference contracts discussed earlier.

The rationale for using authentic assessments is that often special needs students do not do well on traditional assignments. Their production rate may be slower due to visual or motor problems with keyboarding, and they tend to get lost following verbal or written directions. Traditional grading and testing may not reflect their actual learning and capabilities. Providing

alternative methods of assessment gives them the opportunity to show what they can do in a variety of relevant ways in the 9-week period.

Methods of Assessment

In order to assess the effects of the interventions, three basic areas will be assessed. First computer class grades will be monitored and compared. Secondly, student feedback will be collected formally through reflective journal writing to assess their attitudes. Finally, the teachers in the study will complete peer evaluations to assess their performance and improvement in using inclusion strategies.

The most obvious method of assessment will be that the targeted students achieve better grades in computer class. This will be measured in several ways. Weekly grades will be recorded and the final grades of special education students from the first and second quarters will be gathered to provide a basis for comparison

A second area of assessment will involve student attitudes regarding their performance in computer class. Results of student surveys will be reviewed. Then, a discussion of post-intervention reflections will follow. Along with this, the researchers will present any pertinent comments or observations contained in anecdotal records. This will help assess the effects of the project on student attitudes about computer class.

Finally, the effects of this project on the teachers involved in the study will be evaluated. Because the methods of improving inclusion students' performance have a great deal to do with collaboration, the teachers should assess how their approaches and attitudes towards inclusion were impacted. This will be accomplished with the use of a peer evaluation form to objectively review each partner's performance in the areas of communication and inclusion strategies.

CHAPTER 4

PROJECT RESULTS

Historical Description of the Intervention

The objective of this project was to improve the grades of special education students in the inclusive computer applications classroom. This was done through the implementation of a variety of strategies.

The strategies employed consisted of successful inclusion practices. First, increased communications between the special education teacher and the computer teacher were utilized. These strategies included teacher observations, scheduled conferencing, discussion of student IEPs, and collaboration on individual student modifications.

Second, special education students were included in student conferences to help them identify their problems and needs. Any individual modifications were discussed and contracts were then developed, discussed, and signed by the students involved. In addition, students were asked to make self-observations of their in-class performance.

The last strategy implemented was the use of authentic assessments in the areas of performance demonstrations, peer- and self-evaluations, rubric scoring, and cooperative work. These strategies were chosen as a workable method of having students show what they know.

The study began with the identification of special education students that would be involved. This was done by going through the students' schedules and finding those listed for the third and fourth quarter computer classes. Next, the special education teacher developed a student data summary (Appendix E). Each student's IEP was introduced to the computer teacher utilizing this student data summary form. The purpose of the student data summary

form was to communicate in simple terms how a student's learning disabilities affect their classroom performance. At present, the special education teachers at the targeted school have no standard format for presenting this information to related arts teachers.

Collaboration techniques were then employed as the special education and the computer teachers scheduled meetings twice a week or more often as needed. The first meeting involved the discussion of the new student data summary form and how it would apply to each student's performance in computer class. Subsequent meetings covered the necessary steps of the intervention strategies.

It was also established that teacher observations be made using a student observation checklist (Appendix B) which would determine if students were paying attention, staying on task, and completing assignments on time during computer class. Observations were made on different days by both teachers involved in the study. This checklist was developed based on inclusion students' behaviors in past years. These former students exhibited behavioral problems as well as learning disabilities in the computer classroom. The checklist was utilized for approximately three weeks and then dropped. The targeted students showed no behavioral problems as they consistently appeared to be on task and attempting to use the class time wisely. It also became apparent that class size and time restrictions kept the computer teacher from making immediate feedback on the checklist. It was decided that this form was not effective; it was not providing information helpful for interventions. Although the checklist itself was not beneficial, it did provide the special education teacher with a means of observing the classroom environment and day-to-day expectations of the computer teacher.

Another collaborative meeting topic was to develop student contracts (Appendix F), and preplan the student-conference meetings. In order to set up an effective student conference, the special education and computer teachers discussed what would be expected of each student in terms of assignments and skill development based on the student data summary form. From this discussion, a tentative outline of the student contract was developed.

The student contract's purpose was for the student to come to an understanding of what the criteria were for him or her to receive a C or better. The teachers invited student feedback and concerns about the classes during the conference. However, students had little to say in these discussions because they had rarely or never been involved in this type of conferencing.

As an added benefit for student improvement, extra credit was provided in terms of a student self-check (Appendix G). Students were asked to monitor themselves and receive a point of credit for each day they filled out the form. It was thought that this procedure might help students become more aware of positive student behaviors to improve their participation in the computer class. This, however, was not effective, as filling out the checklist never became part of their daily routine.

The computer teacher utilized several means of authentic assessments to evaluate students in a multiplicity of ways. One of the first things put into place was to have students evaluate themselves and their peers. For the seventh grade computer class, the computer teacher set up several long-term projects—the most extensive of these was the creation of a PowerPoint presentation entitled "All About Me." Students were to create and present to the class a presentation about themselves. Students began by watching a demonstration of a presentation done by another student the year before. This was to show students what they would be able to

accomplish once they worked through a series of handouts. They began by creating a presentation for a fantasy company. After this work was checked in—no grades were issued—the computer teacher gave instructions on how to use the scanner and demonstrated other means of enhancing a PowerPoint presentation. How-to instructions were displayed near any machines students used for this purpose. The computer teacher made it clear that she was also there to help them implement any ideas that they might have such as recording their own voice and inserting it into their presentations.

The assignment (Appendix H) was handed out, and the presentation requirements were explained to the class and questions answered. These handouts were kept at the front of the class so that students could access them at anytime for review and to be sure the requirements were met. Two to three days of the class were taken to work on a number of requirements such as a biopoem, a collage, and a PMI.

After completing the presentation, students were to evaluate themselves using the student self-assessment adapted from Barb Thorson (1998) as shown in Appendix I. Part of the self-assessment was to ask students if they met the requirements listed on the assignment handout; and then to make sure that they did, they were asked to list 6 of them. Students were asked if they used creativity and how. They were asked to reflect on the best thing they did, how they could improve their presentations, and what they learned by completing this project. Students were to fill this out accurately and honestly and would receive points for doing so. They could access the assignment sheet for any requirement information needed, and points were deducted only when questions failed to be answered or if the sheet was not turned in.

Students were then to have two of their peers evaluate their presentation using a rubric adapted from Barb Thorson (1998) found in Appendix J. This 5-point rubric asked students to evaluate the overall presentation, the information provided, and the graphics and scanned images. The student could receive up to 30 points by having two peers evaluate the presentation. If a student disagreed with an evaluation, the computer teacher would intercede and reevaluate the project.

After developing contracts and putting authentic assessments into place, the researchers still found it necessary to develop other modifications. First, the computer teacher created a modified 6th grade lesson chart (Appendix K). This tool consisted of a reduced number of assignments for inclusion students who have a difficult time with their keyboarding skills. Because the 6th grade instruction focuses almost exclusively on keyboarding skills and most assignments must be completed individually, the reduced assignments allowed the students to feel less pressured. The second type of modification was developed for individual students as indicated by observations or weekly grade monitoring. These modifications were a natural outcome of the two teachers' increased communication. For example one student who could not understand the "All About Me" project, even with a peer's assistance, was given extra time to work on it in her study skills class. This allowed her the extra time and assistance she needed to successfully complete her presentation and gain a better understanding of the requirements and software applications.

Presentation and Analysis of Results

Student progress was recorded weekly in computer class. Grades were posted on Mondays so that students could see their own progress from the previous weeks. These records were also kept by the computer teacher to keep track of targeted students and share this information with the special education teacher. Students were able to see what assignments were missing and which assignments they could make up. Although this procedure was very good in theory, it was discovered that many students did not know how to read the grade book and, therefore, did not check their standings on a weekly basis. Several targeted students informed the special education teacher that they had no idea what their grade was at any given time.

Figure 2 on the following page shows the average weekly grade of the targeted students. During the first four weeks of class grades are substantially low. At this time students were just observed with no special modifications being utilized. The red line indicates the mid point of the class when progress reports go out to parents. During week 3 grades begin to rise as the computer teacher indicates that progress reports will be issued soon and students need to come in for extra help and make up missing work.

After the modifications and interventions were put into place, there was a very positive effect. Midterm grades averaged 61 percent—very close to failure. However, after the intervention, grades did not dip again as they usually do after progress reports. Grades of C- were maintained and continued to rise. The chart indicates a 14.8 percent grade improvement for the targeted students from the time of progress reports to the final grade.

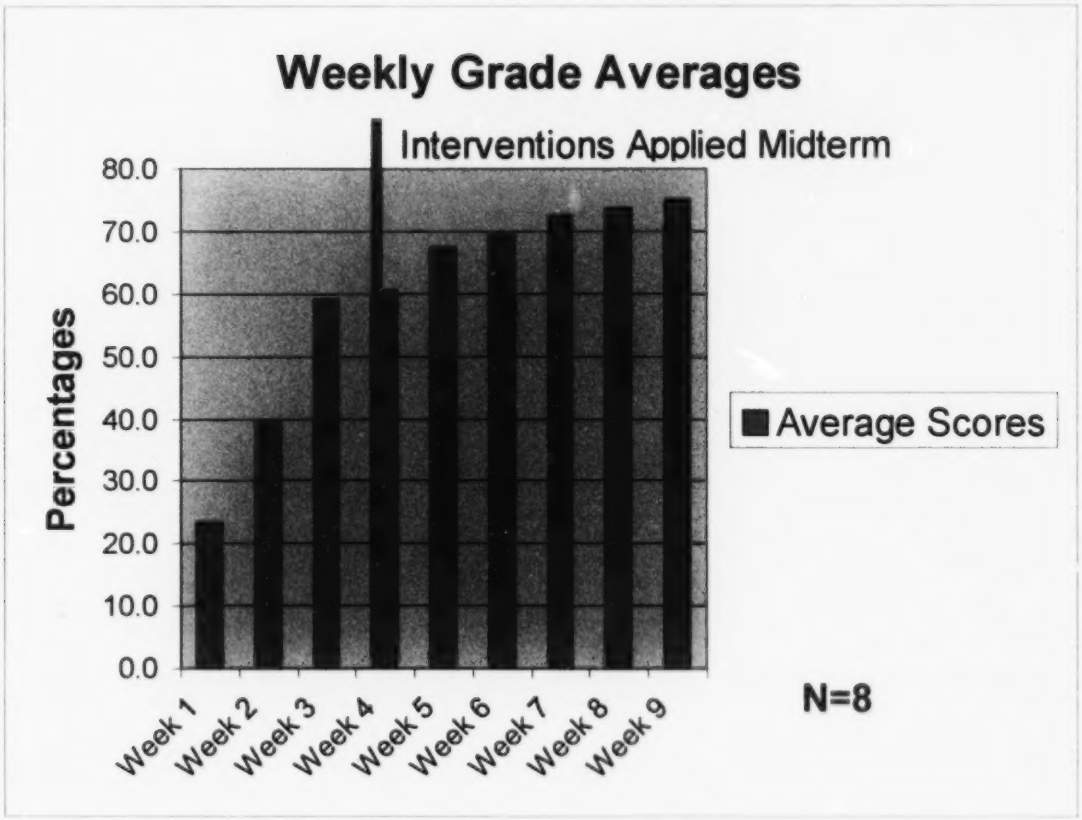

Figure 2: Average weekly grades for targeted students in computer class during the second semester of the 1999-2000 school year. There was a 14.8 percent grade improvement for the targeted students from the beginning of interventions to the final grade.

To assess student attitudes towards computer class after the interventions, students were asked to reflect on their experiences. The special education teacher had them reflect during their language arts class with a journaling assignment. Suggested topics to think about while writing included the following:

- What did you learn?
- What was hard for you?
- Did you get help when you needed it? How?
- What was your favorite part of the class?
- What grade did you get?
- Overall, how did you feel about computer class?

Students seemed to answer honestly, but one area of confusion centered around their grades for the class. Many assumed they had D's or F's, or were not at all sure what grade they had earned. They also expressed continued worry about not being able to keep up and get assignments done in the same amount of time as their peers.

Positive feedback discussed being able to get help, new things they learned, and their favorite things to do. The 6th graders, whose class focused mostly on keyboarding skills, all stated they learned many new keys and increased their speed. They also discussed that they liked learning "how to get into things," drawing programs and using the internet. All students in the intervention group identified peers and the computer teacher as sources of help, and reported no sense of not receiving help when they needed it. The 7th graders all agreed that doing the slideshow PowerPoint Presentation was their favorite thing. The students had many more positive comments at the end of this study than when surveyed prior to the intervention. All the

students in the targeted group could clearly discuss good points about computer class and the things they had succeeded in doing there.

In addition to this study's impact on inclusion students, it seems important to analyze its impact on the teachers of these inclusion students. The researchers chose to do an authentic assessment of each other in the form of a peer evaluation. (Appendix L).

Five main areas were evaluated:

1. What were the major responsibilities assumed by each partner?
2. What was the level of commitment to collaboration?
3. What were the strengths as a cooperative team member?
4. What areas needed to improve?
5. What was learned from the partner?

Each teacher said that the other very naturally took responsibility for the areas in which she was most knowledgeable. For example, the computer teacher took responsibility for modifications within her class, while the special education teacher developed a brief summary form to discuss each student's disabilities. The computer teacher was also very willing to lend her expertise in teaching the special education teacher about computers. The special education teacher gave feedback on techniques and styles of presentation that work well for the targeted students.

Both rated their partner as 100% committed to this collaborative process. Time and sincere communication gave this area its success. They continued to meet several times per week during the 5-month intervention period to make task assignments, relay information, and assess how the students were doing.

In researching the topic, many names were given to cooperative teaming for inclusion. These included co-teaching, cooperative teaming, collaboration, and many more. Part of the success of this study is attributed to the two teachers' willingness and ability to work cooperatively. Both described their peer as flexible, open, patient, and a good listener.

Areas of improvement included using more technology in the special education classroom and for the special education teacher to become more knowledgeable about computers. For the computer teacher, feedback discussed using callbacks for students to keep them paying attention during instruction. This technique involves calling on students to restate what the teacher said. It holds all students accountable for listening, because they do not know when it will be their turn to be called on.

Both teachers agreed they had learned much from this collaborative experience. Some learning involved dealing with special needs students more effectively. Other learning involved what occurs when working closely with another teacher. Sharing ideas, building confidence, and being given a different perspective on inclusion were all benefits of this process.

Conclusions and Recommendations

Based on the presentation and analysis of the data on improving grades for inclusion students, the students involved in the conferencing and modifications strategies did improve their grades in computer class. Their overall attitudes towards being able to succeed in computer class also showed improvement. By increasing the computer teacher's knowledge and understanding of the learning difficulties of the inclusion students, many appropriate modifications were implemented. The use of authentic assessments involved all students and thus followed a true inclusion model. Finally the use of these intervention techniques to achieve the goal of improved

assignment completion and grades for inclusion students affected positive change and a co-teaching partnership for the two teachers involved in the study.

Student attitudes showed improvement in several ways. This is important because without positive attitudes, many inclusion students assume they will fail and do not attempt to try. Through the conferencing strategy, students were empowered to express their concerns and help in determining grading criteria. In addition, they got a simple, written list of what they must do to improve their grades. This involvement gave them practice in discussing their needs in other inclusive settings. While most of the students had little to say, they still got the message that the teachers were there to help them and that talking about what they needed was an integral part of improving their grades. In the original survey most of the inclusion students expressed neutral to negative attitudes towards computer class. However, after the inclusion techniques of this study were employed, students could identify many more positive thoughts about the class. Through the student contracts and increased teacher communications, students in the targeted groups initiated many more requests to go to the computer lab during study hall. This demonstrates that these students were taking ownership for completing work and improving their grades. Previously, most of the special needs students were not concerned if their work was not completed.

Two 7th grade students even transferred their computer class knowledge to language arts class. One student displayed her biopoem from the "All About Me" presentation to show other students how the finished poem should look. Another student gave a PowerPoint presentation; this was his alternative assessment for an animal report/poster project. These students will now be better prepared as presentations do become more common in 8th grade classes.

The success of the project for the teachers was an added bonus. Both teachers gained insight into a peer's teaching situation by engaging in peer observations and providing constructive feedback. While this centered around the targeted special needs students, many other related conversations occurred. These included what to do with bilingual students who were struggling in computer class, handling discipline problems, ways to utilize authentic assessments, and cooperative grouping in large classes. The two teachers made inclusion work by following the recommendations of their literature review. Their peer evaluations gave much positive credence to their collaborative experience and its effect on their professional growth.

Recommendations for improving inclusion students' attitudes and experiences in computer class deal with making the class more meaningful. It is felt by the researchers that one conference is not enough. Conferences help clarify student and teacher expectations. Although it was made clear that students could ask for a conference when needed, not one targeted student made a request for another conference. Students are not used to conferencing or keeping track of their own progress; it is, therefore, important for teachers then to initiate follow-up conferences in order to keep students informed. Additional conferences would include discussing topics such as: current grades, additional modifications, general morale, meeting class objectives, and how to read the posted grade sheet. These procedures will help students understand how to succeed in computer class as well as any academic class.

A suggestion from a parent came through a conversation regarding the study's parent permission slip. One mother discussed how glad she was that a concerted effort was being made to increase her son's computer skills. She said she had a niece in high school that also has significant learning disabilities. The mother had her niece talk to her LD son about how useful

the computer has been in compensating for her disabilities in high school. This conversation led to the idea of having a high school student speak to the inclusion students—or maybe to all of the computer class students about the benefits of utilizing computers. This could both improve attitudes towards computer class and give students an answer to the age-old question, "What do we have to learn this for?"

The number one recommendation for all teachers is to be open to inclusion practices. No matter what subject is being taught, some students will require modifications or adaptations. Be flexible and ask questions about special needs students in particular. Most of the research reviewed for this study indicates communication, support, a team approach, cooperative learning, and authentic assessments to be major factors in facilitating successful inclusion. These are best practices for teaching all students.

A major concern for teachers is the amount of time needed to implement changes, learn about student needs, and communicate with other teachers. Teachers must make the time—even if it is only 10 or 15 minutes once or twice a week to:

- ask questions about specific students.
- observe another teacher working with special needs students.
- ask for support with inclusion students.
- do whatever is reasonable to improve inclusion in particular classroom situations.

Special education teachers and staff must set the example in making inclusion work. They should develop efficient communication methods that are not seen as time-consuming by other teachers. During the study, both researchers were mindful of the fact that one worked with 21 high-maintenance special education students; and the other was responsible for six different

groups of over 160 students at a wide variety of ability levels. Special educators must role model and be available to support inclusion to increase its success.

Another recommendation is to make connections across subject areas. This is an effective and do-able strategy. For example, using spreadsheets in math class ensures more students paying attention to the spreadsheet lesson in computer class. Language arts classes very naturally tie to lessons on word processing skills. The ability to research information in all subject areas is vastly increased as students improve skills in internet usage. As computers are becoming a more familiar part of all classes, the importance of the students' participation in computer applications class should be obvious both to students and teachers in other subject areas. If teachers work together to teach computer skills for students to use in another class, they are collaborating and providing opportunities for students to make connections in their learning. This will help special education students, but is a good teaching practice for all students.

In conclusion, it is basically the willingness to work with other people—students and teachers—that makes inclusion successful. Taking the time to do student conferencing, giving students extra help, re-explaining things, even just being open to having special needs students included in a class all require a willingness to work with students. Although this is obviously what a teacher's job is, many feel apprehensive about meeting inclusion students' needs and how to adapt or modify class work. Successful inclusion does take extra time, but in the long run it helps the teachers involved gain new insights and improve professionally to the benefit of all students. In an era when students are often involved in cooperative learning, it is gratifying to see teachers involved in the cooperative learning that takes place implementing inclusion strategies.

There is no down side to inclusion. The word means being involved. It means teachers help each other to help all students be successful. In action research involvement is required, and it insists on teachers putting into practice what they are researching. In the models of inclusion, co-teaching or consultation requires teachers to work together for a common end. Even considering that a teacher may get an incompatible partner, there is still much to be learned from the collaborative process of inclusion. Learning from each other and learning by doing were the foundations of this study and are also the foundation of helping inclusion students succeed.

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APPENDICES

Appendix A

Student Questionnaire

STUDENT QUESTIONNAIRE

Read the statements below and circle the answer that best matches your feelings.

1. I like school.	1. Always Sometimes Never
2. I like being in classes with regular students.	2. Always Sometimes Never
3. I am more comfortable in my special education classroom.	3. Always Sometimes Never
4. I try hard to get good grades in my regular classes.	4. Always Sometimes Never
5. I try hard to get good grades in my related arts classes.	5. Always Sometimes Never
6. I am proud of my report card grades.	6. Always Sometimes Never
7. People think I am a slow learner.	7. Always Sometimes Never
8. I like using computers to do my homework.	8. Always Sometimes Never

Please answer either question below or you may answer both of them.

Computer class is <u>easy</u> for me because:_____

_____

_____

Computer class is <u>hard</u> for me because:_____

_____

_____

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Appendix B

Student Observation Checklist

STUDENT CHECKLIST

Yes ✔
No --
Not Applicable NA

STUDENT NAME	DATE	EYE CONTACT DURING INSTRUC-TIONS	COULD VERBALIZE 1ST STEP OF ASSIGNMENT	NEEDED A REMINDER TO KEEP ON TASK	HANDED IN ASSIGNMENT ON TIME.	ASKED FOR PASS TO COME IN AND FINISH WORK

Appendix C

Professional Survey

Professional Survey

Please help us with our action research! Gail and Lynnette are investigating the pros and cons of inclusion in general and attitudes in particular in this school. Please fill in this questionnaire and put it in Ludwigsen's or Vanderpoel's mailbox as soon as possible. Thanks so much for your time and effort.

Please circle the appropriate answer;

Current Position: Principal/Administrative
General Ed. Teacher
Related Arts Teacher
Special Education Teacher

Number of years in current position	1-2	3-5	6-10	11-37
Number of years in education profession	1-12	13-19	20-24	25-42
Courses in special education or law	0	1	2	more than 2
Years as a school administrator	0	1-6	7-10	11-16 17+

Please answer the following questions using 1 as "strongly disagree" to 6 as "strongly agree." However, please add comments if you feel that will help to clarify your answers.

1. It is important to make modifications for students who need adaptations to benefit from a particular instructional environment.	1.	1	2	3	4	5	6
2. Students' progress should be graded according to ability rather than only with standardized measures.	2.	1	2	3	4	5	6
3. Our school/school district has a broad continuum of services for meeting the needs of all students.	3.	1	2	3	4	5	6
4. Inclusion of students with mild disabilities into regular classes is generally an effective strategy.	4.	1	2	3	4	5	6
5. I have input into the program of students with disabilities who are placed in the regular classroom.	5.	1	2	3	4	5	6
6. Programs like Chapter 1 are effective.	6.	1	2	3	4	5	6
7. Keeping academic expectations consistent for all students is important.	7.	1	2	3	4	5	6
8. Maximum class size should be lowered when including students with disabilities.	8.	1	2	3	4	5	6
9. The inclusion of students with disabilities into the regular classroom can be beneficial to the other students in the class.	9.	1	2	3	4	5	6

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10. I have the needed support to try new ideas and implement creative strategies.	10.	1	2	3	4	5	6
11. Students should be served in regular classes regardless of disability.	11.	1	2	3	4	5	6
12. I have opportunities to talk and plan with my colleagues on a regular basis.	12.	1	2	3	4	5	6
13. It is important to keep behavioral expectations the same for all students.	13.	1	2	3	4	5	6
14. My school/district is a strong supporter of inclusive education.	14.	1	2	3	4	5	6
15. Special education provides a valuable service for students with disabilities.	15.	1	2	3	4	5	6
16. Regular teachers must spend a great deal of time with students with disabilities.	16.	1	2	3	4	5	6
17. Efforts are made to provide opportunities for mutual planning and collaboration among personnel in my school/district.	17.	1	2	3	4	5	6
18. Students should be grouped in ways that allow a wide variety of abilities in each class.	18.	1	2	3	4	5	6
19. All students should be included in regular environments to the greatest extent possible.	19.	1	2	3	4	5	6
20. Slow learners should receive special help outside the regular classroom.	20.	1	2	3	4	5	6
21. Opportunities for staff development are provided by my school district which meet may needs for professional growth.	21.	1	2	3	4	5	6
22. Inclusion in the regular classroom will hurt the educational progress of the student with a disability.	22.	1	2	3	4	5	6
23. Placement of a student with a disability into a regular classroom is disruptive to students without disabilities.	23.	1	2	3	4	5	6
24. In most cases, students should be grouped by ability.	24.	1	2	3	4	5	6
25. I have sufficient training in modifications for included students.	25.	1	2	3	4	5	6
26. I have sufficient training in and understand the concept of co-teaching.	26.	1	2	3	4	5	6

Adapted from Gallis, S. A., & Tanner, C. K. (1995). Inclusion in elementary schools: A survey and policy analysis *Education Policy Analysis Archives*, [http://olam.ed.asu.edu/epaa/v3n15.html] 3 (15), 1-2.

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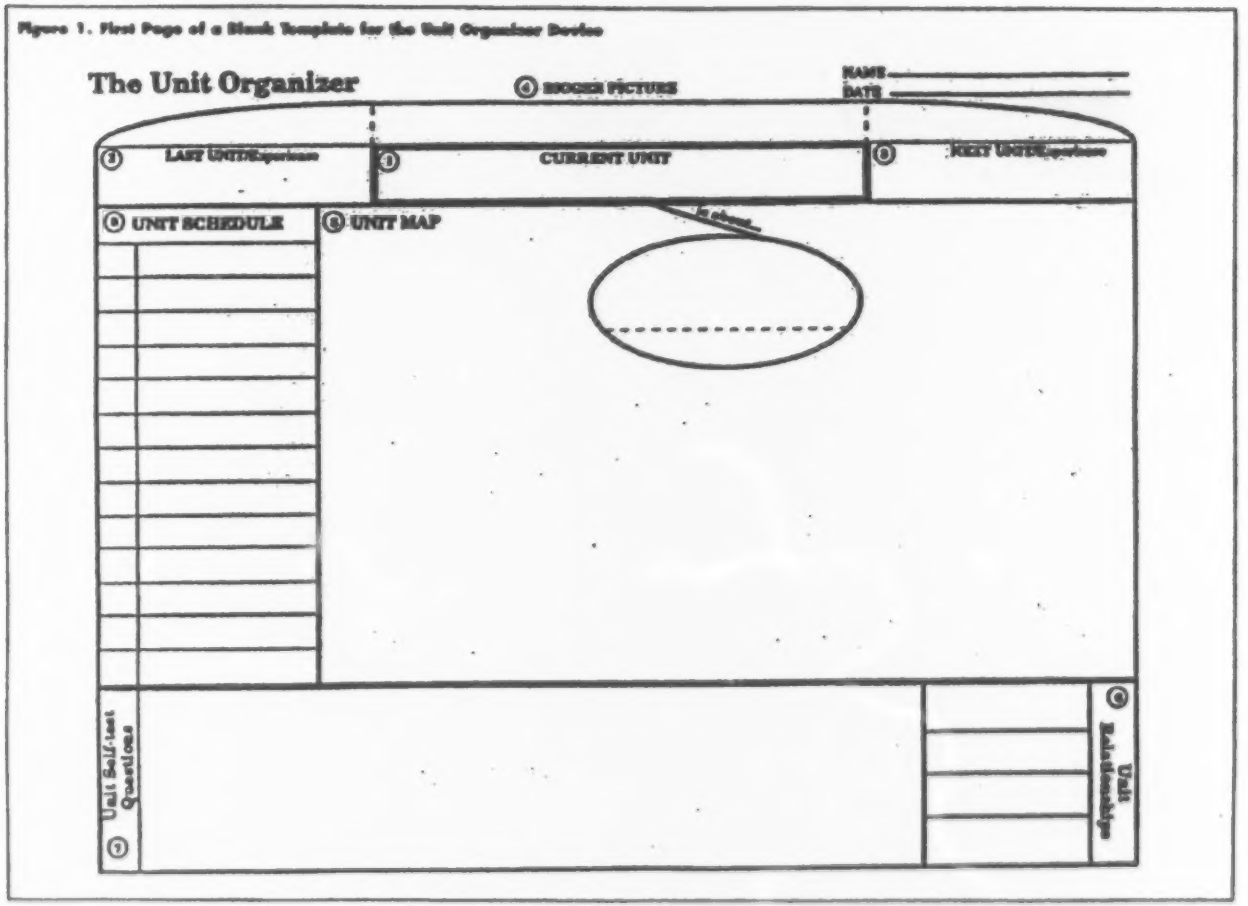
Figure 1. First Page of a Blank Template for the Unit Organizer Device



Appendix E

Student Data Summary

STUDENT DATA SUMMARY

NAME: _____

AGE: _____

GRADE: _____

HISTORY:

DISABILITY:

WHAT THE STUDENT CAN DO:

WHAT THE STUDENT CANNOT DO:

ADAPTATION AND MODIFICATIONS:

Appendix F

Student Contract

Student Contract

Date_____

I _____ do agree to try, pay attention, ask for help, and put in extra time during study hall if needed in computer class.

I understand the expectations for me to receive a C or better are:

1. _____
2. _____
3. _____
4. _____
5. _____

Comments:

_____
Student signature

_____
Teacher signature

_____
Teacher signature

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MY CHECKLIST

Name_____
Class_____

Yes +
No 0
Not Applicable NA

DATE	I LOOKED AT MY TEACHER WHEN SHE GAVE THE INSTRUCTIONS	I COULD TELL YOU HOW TO START THE ASSIGNMENT	I NEEDED REMINDERS TO KEEP ON TASK	I HANDED IN MY WORK IN ON TIME.	I ASKED FOR A PASS TO COME IN AND FINISH WORK	I CHECKED THE GRADE SHEET AND I HAVE A GRADE OF:

Appendix G
My Checklist

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ALL ABOUT ME PRESENTATION 5-POINT RUBRIC

Student Grader: _____

Date: _____

	Super Work	Very Good Stuff	Good	I Can Live With It	Try Again!	
Numerical Score	5	4	3	2	1	Points
Overall Presentation	The project flows well, keeps the attention of the audience, and is very interesting	The project flows well and is interesting.	Majority of project flows well and has some interesting items included.	Majority of project doesn't flow well and is somewhat interesting.	Project does not flow at all, is poorly presented, and is not interesting.	
Text Information	The information used is accurate, well written, complete with proper grammar and punctuation.	Most of the text is accurate, uses proper grammar and punctuation, and mostly flows well.	Uses an acceptable amount of text. Information is accurate. Acceptable grammar and punctuation.	Text information is short and inaccurate. Grammar and punctuation are mostly incorrect.	Information is missing and grammar and punctuation is misused.	
Graphics and Scanned Images	Images are used to enhance the information and support the text. Placement of images is pleasing to the eye.	Images are used to enhance and support the text. Placement is appropriate.	Images enhance the information somewhat. Image placement is acceptable.	Images used have relevance to information. Not enough images used.	No scanned images used. Images have no relevance to the information.	
					Total Points	

COMMENTS:

_____ Name _____ 7-1 or 7-2

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Appendix K

6th Grade Modified Lesson Chart

6th Grade Lesson Chart

Lesson Part	Points	Percent	Grade
1. Conditioning Practice	5	16%	F
2. New Key	10	33%	F
3. New Key	20	66%	D
4. Combine New Key	23	76%	C
5. Build Skill	25	83%	B
6. Game	30	100%	A+
7. (Extra Credit +2) Improve Keystroking	32	106%	A+

6th Grade Modified Lesson Chart

Lesson Part	Points	Percent	Grade
1. Conditioning Practice	10	33%	F
2. New Key	15	66%	D
3. New Key	23	76%	C
4. Combine New Key	25	83%	B
5. Build Skill	30	100%	A
6. Game	31	100%	A+
7. (Extra Credit +2) a. Improve Keystroking	32	106%	A+

Appendix L

Improving Inclusion: Peer Evaluation

IMPROVING INCLUSION: PEER EVALUATION

1. For what areas did your collaborative partner assume major responsibility in this action research?

2. Describe your peer teacher's level of commitment to collaboration on improving inclusive practices for special needs students.

3. Discuss the strengths this person possesses as a cooperative team member.

4. List areas of improvement for your peer, either in their teaching or in the area of action research.

5. What did this person teach you?